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Performance Measure		November 11, 1996
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W R Sproles **Originator Name**	G D DiGregorio **QA Approval**	A M Tyson **Contractor Manager(s)**
A. K Sieben **Kaiser-Hill Program Manager(s)**	T G Hedahl **Kaiser-Hill Director**	

Document Subject

TRANSMITTAL OF THE DRAFT PROPOSED ACTION MEMORANDUM FOR THE SOURCE REMOVAL AT THE MOUND SITE, IHSS, REV B - AMT-093-96

KH-00003NS1A 96-RM-ER-0210-KH

Discussion and/or Comments

Please find enclosed the Draft Proposed Action Memorandum for the Source Removal at the Mound Site for concurrent review by Kaiser-Hill and DOE A meeting will be held to discuss comments and determine resolution on November 19, 1996 at 1 00 p m in conference room number 68 in Building T893B If document review is completed prior to November 19, 1996, please fax comments to extension 5198 If you have any questions regarding this document, please contact Wayne Sproles at extension 5790

Enclosure
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DRAFT

November 11, 1996 96-RF-XXXX

Jessie M Roberson
ES&H Program Assessment
DOE/RFFO

TRANSMITTAL OF THE PROPOSED ACTION MEMORANDUM FOR THE SOURCE REMOVAL AT THE MOUND SITE, IHSS 113, REV B –TGH-XXX-96

Please find enclosed the Proposed Action Memorandum for the Source Removal at the Mound Site A meeting will be held to discuss comments and determine resolution on November 19, 1996 at 1 00 p m in conference room number 68 in Building T893B If document review is completed prior to November 19, 1996, please fax comments to extension x5198 If you have any questions regarding this document, please contact Ann Sieben of my staff at (303) 966-9886

Tim G Hedahl
Kaiser-Hill

DRAFT

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COMPANY

RMRS Rocky Mountain Remediation Services L.L.C.
protecting the environment

RF/RMRS-96-0059

DRAFT
Proposed Action Memorandum for the Source Removal at the Mound Site IHSS 113

November 1996

PROPOSED ACTION MEMORANDUM FOR THE SOURCE REMOVAL AT THE MOUND SITE IHSS 113

November 12, 1996

Revision B
Document Control Number RF/RMRS-96-0059

PROPOSED ACTION MEMORANDUM
FOR THE SOURCE REMOVAL AT THE MOUND SITE
IHSS 113

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ACRONYMS

ARARs	Applicable or Relevant and Appropriate Requirements
CAMU	Corrective Action Management Unit
CCR	Colorado Code of Regulations
CERCLA	Comprehensive Environmental Response and Liability Act
CFR	Code of Federal Regulations
COC(s)	Contaminant(s) of Concern
CSFS	Contaminated Soil Feed Stockpile
CWTF	Consolidated Water Treatment Facility
DOE	Department of Energy
EPA	Environmental Protection Agency
FIDLER	Field Instrument for the Detection of Low Energy Radiation
GAC	Granulated Activated Carbon
HEPA	High Efficiency Particulate Air
IHSS	Individual Hazardous Substance Site
LDRs	Land Disposal Restrictions
mg/L	Milligrams Per Liter
mg/Kg	Milligrams Per Kilogram
OSHA	Occupational Safety and Health Administration
PA	Protected Area
PAM	Proposed Action Memorandum
PCE	Tetrachloroethylene or Perchloroethylene
PPE	Personal Protective Equipment
RACT	Reasonable Available Control Technologies
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RMRS	Rocky Mountain Remediation Services
RFI/RI	RCRA Facility Investigation/Remedial Investigation
SAP	Sampling and Analysis Plan
TCE	Trichloroethane
TDU	Thermal Desorption Unit
TU	Temporary Units
VOC(s)	Volatile Organic Compound(s)
yd	Cubic Yards

1 0 PURPOSE

This Proposed Action Memorandum (PAM) outlines the approach that will be taken and the applicable requirements for the excavation and subsequent removal of volatile organic compounds (VOCs) from soil at the Rocky Flats Environmental Technology Site (RFETS), Individual Hazardous Substance Site (IHSS) 113 The IHSS 113 is also known as the Mound Site

This source removal is being conducted in accordance with the Final Rocky Flats Cleanup Agreement (RFCA) (DOE, 1996) The VOCs addressed by this action are Comprehensive Environmental Response and Liability Act (CERCLA) hazardous substances and Resource Conservation and Recovery Act (RCRA) hazardous waste constituents contained in an environmental media (soil) Removal and treatment of the hazardous substances at this site will mitigate a source of groundwater contamination in the area

2 0 PROJECT DESCRIPTION

Between 1954 and 1958, drums containing uranium, beryllium, hydraulic oil, carbon tetrachloride and tetrachlorothene (PCE) were stored at the Mound Site Records also indicate that some of the drums contained low levels of plutonium Prior to removal of the drums in 1970, some of the drums were know to have leaked and the resulting contamination is impacting groundwater It is expected that approximately 400 to 1 000 cubic yards (yd^3) of soil are contaminated with VOCs above the Tier I Subsurface Action Levels specified in the RFCA

Under this proposed action, the contaminated soils will be removed from the Mound Site and processed using thermal desorption to remove the VOC contamination a process used successfully on several similar sites at the RFETS At the conclusion of the project, the treated soil will be returned to the Mound Site and the area restored to a comparable undisturbed condition The intent of this source removal is to remove the contaminants of concern (COCs) that may leach into the groundwater The groundwater at the Mound Site will be addressed as part of the Site Groundwater Management Strategy

Information on site history chemical and radiologic contamination geology and hydrogeology of the Mound Site have been collected over many years and documented in various reports

Information used to prepare this PAM has been taken from the *Rocky Flats Environmental Technology Site Historical Release Report for the Rocky Flats Plant* (DOE, 1992), the *Phase II RFI/RI Report for Operable Unit No 2* (DOE, 1995), the *Soil Vapor Survey Report for Operable Unit 2 Subsurface Interim Remedial Action* (EG&G, 1994), the *Draft Trenches and Mound Site Characterization Report* (RMRS, 1996a), and from *Results of the 1996 Pre-Remedial Investigation of the Mound Site* (RMRS, 1996b) The location of the Mound Site is shown in Figure 2-1

The RFCA cleanup action Levels used for determining the extent of excavation are given in Section 3 2 1 The performance or treatment standards for the thermal desorption unit (TDU) will be the RCRA Treatment Standards for Hazardous Waste (6 Colorado Code of Regulations (CCR) 1007-3, 268 40) for the VOCs found in the Mound Site soils These standards are given in Section 3 2 3

2 1 Background

The Mound Site is located north of Central Avenue, and east of the Protected Area (PA) fence Approximately 1,405 intact drums were placed at the Mound Site between April 1954 and September 1958 and covered with soil, thus generating a "mound" The drums originated from Building 444, Building 888, Building 883, Building 771, and Building 776 The drums contained uranium and beryllium-contaminated lathe coolant (a mixture of approximately 70 percent hydraulic oil and 30 percent carbon tetrachloride) Historical information also indicates that some of the coolant contained plutonium In addition, some of the drums contained PCE which has been found at high concentrations in monitoring wells and soil borings at the Mound Site

In 1970, all drums were removed from the Mound Site along with some radiologically contaminated soil Approximately 10 percent of the drums were thought to have holes at the time of removal Solid material was shipped offsite for disposal while liquids were sent to Building 774 for processing No airborne radiological contamination was detected during the drum removal Soil from the excavation was graded and the excess was placed in the landfill

Recent characterization data indicates VOCs predominantly PCE have been detected in subsurface soils at levels requiring cleanup Records however do not exist of the volume of contaminants released to the soils at the Mound Site

2.2 Hydrogeologic Setting

The hydrogeologic setting consists of 12 to 13 feet of Rocky Flats Alluvium (calcareous sandy gravel and clayey gravel) unconformably overlying claystone and sandstone of the Arapahoe Formation, which unconformably overlies the primarily massive claystone of the Laramie Formation The surface soils in the vicinity of the Mound Site were disturbed during the creation and removal of the Mound, construction of the PA fence, excavation of the Central Avenue ditch, and other construction activities in the area (DOE, 1995)

The locations of boreholes and wells used to characterize the Mound Site are given in Figure 2-2 Groundwater seasonally ranges in depth from approximately 6 feet below ground surface to below the contact between the underlying Arapahoe Formation and the Rocky Flats Alluvium The bedrock water table, defined by wells completed in the Arapahoe Formation, ranges in depth from 15 to 20 feet below ground surface The groundwater flow direction in the Rocky Flats Alluvium is primarily to the north Seasonal recharge from the ground surface and the Central Avenue ditch causes groundwater to flow towards the north at a gradient of 0 011 ft/ft Mean hydraulic conductivities are $2\ 06 \times 10^{04}$ for the Rocky Flats Alluvium and $8\ 82 \times 10^{07}$ cm/s for the weathered claystone VOC contaminants that may originate from the Mound Site are observed in downgradient monitoring wells and seeps Figure 2-3 depicts the generalized hydrogeologic cross section at the Mound Site

2 3 Mound Contamination Data Summary

A brief summary of the characterization data reports referenced in Section 2 0 is presented below In May 1995 four boreholes were drilled at the Mound Site (RMRS 1996a) to evaluate soil gas survey results from the previous year (EG&G 1994) During August 1996 16 boreholes were drilled for the purpose of characterizing and defining the extent of subsurface contamination (RMRS 1996b) identified by the 1995 investigation In addition seven monitoring wells and six boreholes have been drilled in the vicinity of the Mound Site during the past nine years The locations of these boreholes and wells are shown in Figure 2-2 Subsurface soil and groundwater contamination at the Mound Site is summarized below

2 3 1 Groundwater

Groundwater samples from upgradient wells (4386, 2387, 01791, 01891, and 12091) and downgradient wells (0174, 1987, 2087, 02191, and 02291), summarized in Tables 2 3 1-1 and 2 3 1-2, indicate an increase in PCE and trichloroethane (TCE) in the groundwater passing through the Mound Site These wells are screened in the Rocky Flats Alluvium and weathered claystone of theArapahoe Formation (DOE, 1995) The presence of VOC contamination in the upgradient wells has been linked to the 903 Pad and other potential sources The increase in concentrations of PCE in the groundwater downgradient of the Mound Site indicates the site is a source of groundwater contamination The solubility of PCE is 150 mg/L (Cohen and Mercer, 1993) This containment was observed at a concentration of 528 mg/L in downgradient well 0174 This indicates the potential presence of a dense nonaqueous phase liquid, PCE product, in the source area (EPA, 1992)

TABLE 2-1
MOUND SITE UPGRADIENT GROUNDWATER SAMPLING RESULTS SUMMARY

Contaminant	Well 4386	Well 2387	Well 01791	Well 01891	Well 12091
PCE	0 0003	0 074	0 016	0 002	0 00059
TCE	<0 005	<0 005	0 001	<0 0002	0 0003

Note all concentrations are maximum observed concentrations and reported in mg/L

TABLE 2-2
MOUND SITE DOWNGRADIENT GROUNDWATER
SAMPLING RESULTS SUMMARY

Contaminant	Well 0174	Well 02191	Well 02291	Well 1987	Well 2087
PCE	528	0 98	3 4	0 88	0 091 J
TCE	18	0 067	0 41	0 07	0 005

Note all concentrations are maximum observed concentrations and reported in mg/L J Analyte detected below method practical quantitation limit

2.3 2 Soil

Results from the Phase II RFI/RI investigations, soil gas surveys, and the 1995 and 1996 subsurface investigations of the Mound Site indicate the highest levels of soil contamination are observed in the northeast portion of the site (Figure 2-4) The primary contaminants found during previous soil investigations are PCE and methylene chloride both of which exceed the RFCA Tier I Subsurface Soil Action Levels However results associated with methylene chloride have all had laboratory qualifier flags indicating blank contamination Therefore, methylene chloride may not be a contaminant at this site, but is being included as a COC for completeness

Volatile Organic Compounds in Soil

Figures 2-3 and 2-4 show the extent of PCE contamination at the Mound Site Four subsurface soil samples collected from borehole 14295, representing the interval from ground surface to a depth of 15 feet, exceeded the PCE Tier I Subsurface Soil Action Level specified in Table 3-1 These foursamples contained concentrations of PCE ranging from 220 up to 760 mg/kg Borehole 250296 was observed with 160 mg/kg PCE at a depth of 5 5 feet Borehole 251696 was observed with 440 mg/kg PCE at a depth of 7 to 8 feet and 0 41 mg/kg PCE at a depth of 11 to 13 feet Figure 2-4 presents the PCE concentrations detected in the Mound Site boreholes

Pesticides and Polychlorinated Biphenyls in Soil

No pesticides or polychlorinated biphenyls (PCBs) were detected above the RFCA Subsurface Soil Action Levels

Metals in Soil

Analyses for beryllium a component of the material contained in drums previously stored at this site, indicated no detections above Subsurface Soil Tier I Soil Action Levels In addition no other metals were detected exceeding the RFCA Tier I Subsurface Soil Action Levels

Radionuclides in Soil

No radioactive isotopes were detected above the RFCA Tier I or Tier II Subsurface Soil Action Levels Only one soil sample approached the RFCA Tier II Action Level for radionuclides in subsurface soil The Action Level approached is 103 pCi/g for uranium-238 Sample BH20837WC from borehole 14295 was collected from ground surface to a depth of 5 feet and contained a uranium 238 activity of 101 1 pCi/g Therefore radionuclides are not a COC for the

project It should also be noted that this uranium sample came from a borehole with the highest VOC concentrations

3 0 PROJECT APPROACH

The proposed accelerated action will entail excavating soil contaminated with VOCs from the Mound Site and processing the soil using thermal desorption technology to remove the VOCs Following thermal desorption, the treated soil will be returned to the site and the area re-vegetated The project will be conducted in accordance with the RFCA guidelines, and with DOE and RFETS Environmental Restoration policies and procedures The project will also utilize lessons learned from previous accelerated actions

3 1 Proposed Action Objectives

The objective of the accelerated action is to remove VOC-contaminated soils from the Mound Site, thereby preventing further degradation of groundwater The subsurface soils at the original Mound Site contain substantially higher concentrations of VOCs than the surrounding areas This source removal will remediate one of the top ten IHSS sites at RFETS

3 2 Proposed Action

This action will involve excavating approximately 400 to 1,000 yd^3 of soil from the site using standard excavating equipment The soil will be temporarily stockpiled, awaiting thermal desorption processing The stockpiled soil will be staged approximately 600 feet east of the Mound Site, in the area where the Thermal Desorption Unit (TDU) will be mobilized to process the soil (Figure 2-1)

3 2 1 Excavation

Conventional excavation techniques will be used to remove the contaminated soil at the Mound Site Excavation equipment will consist of a track-mounted excavator backhoe and/or front-end loader Contaminated soils will be moved in dump trucks or by similar transport to a staging area which is described in Section 3 2 2

During soil handling activities dust minimization techniques, such as water sprays, will be used to minimize suspension of particulates In addition, earth-moving operations will not be conducted during periods of high winds The RFETS Environmental Restoration Field Operations Procedure FO 01, Air Monitoring and Dust Control, will be used to monitor wind speed and stop work, as required, during high winds

An organic vapor analyzer will be used as a field screening tool to guide excavation activities When project personnel estimate that VOCs have been removed, samples will be collected along the base and sides of the excavation, in accordance with the Sampling and Analysis Plan, to establish the post-action condition of the subsurface soil Excavation will continue until the Cleanup Action Levels listed in Table 3-1 have been met, or until as much contaminated soil has been removed as is reasonable Considering the bedrock and groundwater conditions and the possible depth of dense nonaqueous phase liquids contamination at the Mound Site, the excavation will be limited to the highly weathered bedrock just below the alluvial/bedrock contact This highly weathered bedrock is expected to be approximately two to three feet below the top of bedrock

Cleanup Action Levels used for the excavation activities are the RFCA Tier I Subsurface Soil Action Levels These Action Levels were conceived to prevent any further degradation above the Tier I Groundwater Action Levels Table 3 1 lists the cleanup action levels

TABLE 3-1
CLEANUP ACTION LEVELS

Contaminant	Concentration (mg/kg)
Carbon Tetrachloride	11 0
Methylene Chloride	5 77
PCE	11 5
TCE	9 27

The VOCs listed in Table 3-1 are the COCs for the project This list was developed by assessing the existing analytical data from the site and by the use of process knowledge to ascertain what VOCs existed in the drums that were initially stored at the site If other VOCs are identified

during excavation, the appropriate Tier I Subsurface Soil Action Levels will be incorporated as cleanup action levels

To minimize groundwater seepage, and to assist in trench-wall stability, efforts will be made prior to excavation to inhibit the seasonal rise in water table around the Mound Site The Central Avenue ditch running along the southern perimeter of the Mound Site is probably the primary cause of much of the local water-level fluctuation at the Mound Site Since this ditch is unlined, standing water may be recharging the groundwater at the Mound Site Also, as part of the Mound Site excavation, the northern wall of the Central Avenue ditch in the vicinity of the excavation will be removed, leaving a pathway for stormwater to run into the excavation Therefore, prior to excavation, an extension to an existing culvert will be placed along the southern perimeter of the Mound Site This effort will minimize local groundwater recharge and greatly simplify subsequent excavation activities

De-watering of the excavation may also be necessary due to seasonally high water tables If de-watering of the excavation is necessary, a field sump will be created in the bottom of the excavation and pumped into a temporary storage container(s) The water will then be treated in the Consolidated Water Treatment Facility (CWTF) located in Building 891 Following treatment, the water will be sampled and released in accordance with consolidated water treatment facility (CWTF) discharge criteria

3 2 2 Staging of Contaminated Soils

Contaminated soil excavated from the Mound Site will be staged approximately 600 feet to the east of the Mound Site, in the northeast trenches area This site was chosen because it is relatively flat and contains support trailers and utilities from the previous thermal desorption projects at RFETS The excavated soil will be temporarily stored in a Contaminated Soil Feed Stockpile (CSFS) The contaminated soil feed stockpile (CSFS) will be designed to contain the contaminated soil and minimize wind blown dispersion and storm water interaction with the soil by using concrete barriers and a water-resistant tarpaulin In addition a ditch will be constructed surrounding the stockpile to capture local stormwater Storm water collected from this ditch may be used to control dust on soils awaiting treatment in the LDU or will be collected for onsite treatment at Building 891

After treating the stockpiled soil within the CSFS, any residual contaminated surface soil will be removed as necessary and treated by the TDU The criteria listed in Table 3 1 will be used to evaluate the soils beneath the CSFS The regulatory framework for the CSFS is described in Section 5 0

3 2 3 Treatment

A low-temperature thermal desorption unit (TDU) will be used remove the VOCs from the contaminated soils in a non-destructive manner The TDU process heats and passes air through the soil to volatilize or "strip" the VOCs into the vapor phase Vacuum is applied to the soils which further enhances the VOC stripping process Depending on the specific thermal desorption vendor/unit selected, the treatment unit heats the soil to a temperature range between 120 and 700 degrees Fahrenheit No incineration or destruction of VOCs occurs in the TDU at these temperatures

The system will be equipped with a high-efficiency particulate air (HEPA) filter to minimize particulate emissions The off-gases will be captured and cooled in a condenser and subsequently polished using an activated carbon filter system The aqueous phase condensate will be removed from the condenser for further processing at the CWTF in Building 891 If organic phase liquids are recovered from the condenser, these liquids will be containerized for offsite disposal The regulatory framework for the TDU operation is described in Section 5 0

Following processing of soil through the TDU, the soil will be sampled and analyzed to verify that it meets the performance standards for treatment Should the treated soil fail to meet the standards, the soil will continue to be processed until it meets the performance standards The treated soil will then be returned to the Mound Site The performance standards are the RCRA Treatment Standards for Hazardous Waste for the chlorinated solvent-based VOCs that were identified as COCs for this project These standards were taken from the Colorado Code of Regulations (CCR) under Part 6 CCR 1007-3, 268 40 Treatment Standards for Hazardous Waste The standards for the Mound Site COCs are listed in Table 3 2

TABLE 3 2
TDU PERFORMANCE STANDARDS

Contaminant	Concentration (mg/kg)
Carbon Tetrachloride	6 0
Methylene Chloride	5 77*
PCE	6 0
TCE	6 0

* Note Though the hazardous waste regulations stipulate a 30 mg/kg treatment performanc es standard for methylene chloride, this concentration exceeds the "put back" Tier I Action Levels specified by RFCA, and used to guide the activities stated in Section 3 2 1 Therefore, the more conservative RFCA Action Level is used instead of the standard promulgated in the hazardous waste regulations

3 3 Worker Health and Safety

Due to the contaminants present at the Mound Site, this project falls under the scope of the Occupational Safety and Health Administration construction standard for Hazardous Waste Operations and Emergency Response, 29 Code of Federal Regulations (CFR) 1926 65 Under this standard, a Site-Specific Health and Safety Plan will be developed to address the safety and health hazards of each phase of site operations and specify the requirements and procedures for employee protection In addition, the DOE Order for Construction Project Safety and Health Management, 5480 9A, applies to this project This order requires the preparation of Activity Hazard Analyses to identify each task, the hazards associated with each task and the cautions necessary to mitigate the hazards These requirements will be integrated wherever appropriate

This project could expose workers to physical, chemical and low levels o radiological hazards The physical hazards include those associated with excavation activities use of heavy equipment, noise, heat stress cold stress, and work on uneven surfaces Physical hazards will be mitigated by appropriate use of PPE engineering, and administrative controls Chemical hazards will be mitigated by the use of PPE and administrative controls Appropriate skin and respiratory personal protective equipment will be worn throughout the project Routine VOC monitoring will be conducted with an organic vapor monitor for any employees who must work near the contaminated soil (i e soil sampling or excavation

personnel) Based on employee exposure evaluations, the Site Health and Safety Officer may downgrade personal protective equipment requirements, if appropriate If field conditions vary from the planned approach, an Activity Hazard Analysis will be prepared for the existing circumstances and work will proceed according to the appropriate control measures Finally, field radiological screening will be conducted using a Field Instrument for the Detection of Low Energy Radiation (FIDLER) and other appropriate equipment to detect surface contamination Dust minimization techniques will be used to minimize suspension of contaminated soils

3 4 Waste Management

The soils processed in the TDU will be returned to the Mound Site after a determination that soils have attained the treatment performance standards Based on previous sampling investigations, it has been determined that the soils meet the RFCA Tier II levels for all radionuclides of concern Additional sampling for radioisotopes will be performed if direct monitoring indicates that radionuclide levels may be present above Tier II values

Any ancillary wastes generated as part of this proposed action, such as personal protective equipment, will be characterized based on process knowledge and radiological screening Waste will be managed, recycled, treated, and/or disposed of in accordance with RFETS policies and procedures, and in accordance with Federal, State, and local laws and regulations

The residual materials collected as part of the thermal treatment process, such as granulated activated carbon (GAC), the aqueous and organic phase condensate, and the high efficiency particulate air (HEPA) filters, will be managed according to the knowledge of the process that generated the residual wastes, radiological screening and, where appropriate, additional analytical characterization The spent granulated activated carbon (GAC) generated from polishing the TDU's offgas is expected to be managed as a hazardous waste If feasible, the GAC may be sent offsite for regeneration and later reuse The aqueous phase condensate will be treated onsite at the Consolidated Water Treatment Facility located in Building 891 If an organic phase condensate is recovered, this material will be packaged for off-site incineration The HEPA filters may contain low levels of radionuclides and will be managed onsite until they can be sent to an approved disposal facility

4 0 ENVIRONMENTAL IMPACTS

The National Environmental Policy Act requires that actions conducted at the RFETS be evaluated for potential impacts to the environment Impacts to the natural environment resulting from the proposed action will be minimal, they are not expected to result in any adverse impacts to wetlands, floodplains, threatened or endangered species or their habitats, or historic or cultural resources There will be minor releases of air pollutants from heavy equipment operation during excavation as well as minor increases in particulates (dust) associated with the TDU operation Airborne particulates and contaminants resulting from the excavation activities will be controlled using the best management practices, including water sprays and covering Once the removal of the contaminant source from the Mound Site is complete and the processed material is returned to the Mound Site, the site will be restored with appropriate vegetation

5 0 COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS)

RFETS accelerated actions performed under a PAM must attain, to the maximum extent practicable, Federal and State ARARS For that reason, the substantive attributes of the Federal and State ARARs must be identified

In addition RFCA provides for waiver of permits for accelerated actions conducted in the buffer zone (RFCA ¶16 a) The Mound Site, the CSFS, the TDU and Temporary Units will all be located in the buffer zone For each permit waived RFCA requires identification of the substantive requirements that would have been imposed in the permit process (RFCA ¶17) Further, the method used to attain the substantive permit requirements must be explained (RFCA ¶17c)

5 1 CHEMICAL-SPECIFIC REQUIREMENTS AND CONSIDERATIONS

The only chemical specific ARAR identified was the National Emission Standards for Hazardous Air Pollutants (NESHAP) for radionuclides In addition the RFCA Action Level Framework (ALF) Tier 2 Subsurface Soil Action Levels were identified as to be considered

5 1.1 NESHAPs

The 40 CFR §61 92 is applicable and requires that no member of the public receive more than 10 mrem per year above background from airborne sources of radiation Demonstration of compliance with 40 CFR §61 92 is performed on a sitewide basis taking into consideration all RFETS sources Stack monitoring is required for all release points which could contribute greater than 0 1 mrem/year Based upon preliminary estimates, monitoring will not be required A formal analysis will be prepared

5 1 2 Action Level Framework

The Tier 1 Subsurface Soil Action Levels for VOCs provided in the RFCA Action Level Framework were considered and adopted as the Cleanup Action Levels (See Table 3-1)

5 2 ACTION-SPECIFIC REQUIREMENTS AND CONSIDERATIONS

The following action-specific requirements and considerations were evaluated specific to the source removal at the mound site

- Identification and Listing of Hazardous Wastes
- Definition of Remediation Waste
- Land Disposal Restrictions
- Contaminated Soil Feed Stockpile as Corrective Action Management Unit (CAMU)
- RCRA Subpart P Thermal Treatment Unit
- Temporary Unit Tank and Container Storage
- VOC and Particulate Emission Controls
- Radiation Protection of Occupational Workers

5 2 1 Identification and Listing of Hazardous Waste

Requirements governing the identification and listing of hazardous wastes are applicable to the source removal (See 6 C C R 1007 3 §261) Based upon process knowledge and characterization data the contaminated soil contains F 001/F 002 solvents that were released from the drums

5 2.2 Remediation Waste

Remediation waste is defined as

> *all solid and hazardous wastes, and all media (including groundwater, surface water, soils and sediments) and debris, which contain listed hazardous wastes or which themselves exhibit a hazardous waste characteristic, that are managed for the purpose of implementing corrective action (See §260 10)*

The definition of remediation waste is applicable to all wastes and media generated in conjunction with this action

5 2 3 Land Disposal Restrictions

If the F001/F002 soil is actively managed (i e excavated and treated), the land disposal restrictions (LDRs) for the F001/F002 soil become applicable if "placement" of the remediation wastes in or on the land will occur (see §268 40) Selecting the LDRs, and the more stringent ALF Tier 1 Subsurface Soil Action Levels (e g methylene chloride) as performance standards, ensures that it will be permissible to return the treated soil to the excavation (See Table 3-2)

LDRs are not applicable to the F001/F002 aqueous phase condensate generated during operation of the TDU This remediation waste will be treated in the CWTF located in Building 891 to meet applicable surface water standards The Waste Water Treatment Unit exclusion as ARAR is applicable to the CWTF (See §260 10 and §264 1[g](6))

5 2 4 Contaminated Soil Feed Stockpile as a Corrective Action Management Unit

The establishment of the Contaminated Soil Feed Stockpile as a CAMU requires a permit waiver For that reason, the discussion in this section is being provided to satisfy ¶17 of RFCA

Using the CAMU requirements as ARAR is appropriate as indicated by EPA statements in the preamble to the final rule

The substantive requirements of today's regulations for CAMUs and temporary units are expected to be applicable or relevant and appropriate requirements (ARARs) for the remediation of many CERCLA sites (See 58 FR 8679, left column, bottom)

In addition, EPA made it clear that a CAMU is the appropriate mechanism for land-based remediation waste management

For example, under today's CAMU provisions, a waste pile could be designated as part of a CAMU This would enable the Regional Administrator to specify protective liner requirements and other design/operating requirements for the pile that are appropriate to waste and site conditions, and the length of time the unit may operate Further remediation wastes could be placed into the pile without triggering LDRs, thereby enabling one of the most frequent uses of piles, the temporary staging of wastes prior to on-site treatment (See 58 FR 8673, right column, middle)

The CAMU rule is found at 6 CCR 1007-3, Part 264, Subpart S Consistent with the above citation, placement of remediation wastes that may otherwise be hazardous wastes is allowed and does not constitute creation of a regulated unit (See §264 552[a][1]) In addition, the minimum technological requirements (i e design requirements) for waste piles are not applicable (See §264 552[a][2]) As applied in the context of an accelerated action, the Colorado CAMU rule also requires attainment of the substantive requirements of §264 Subpart B, C, D and E (See §264 552[a][3]) The requirements of §264 Subpart B are outlined in the following table

Table 5-1
RCRA §264 Subpart B Substantive Requirements

Citation and Title	Requirement
§264 13 - Waste Analysis	Satisfied by characterization data presented in the PAM
§264 14 - Security	Rely on RFETS infrastructure
§264 15 - General Inspection Requirements	Personnel will inspect equipment during operations
§264 16 Personnel Training	Training requirements will be identified in the project Health and Safety Plan

§264 Subpart C, Preparedness and Prevention is addressed in the RFETS RCRA Part B Permit and by RFETS infrastructure Similarly, §264 Subpart D, Contingency Plan and Emergency Procedures is also addressed in the RFETS RCRA Part B Permit and by RFETS infrastructure §264 Subpart E requirements are administrative in nature and will not be applicable to the CAMU

§264 552(c) includes seven criteria for the CSFS CAMU Two of the criteria are only applicable where waste will be left in place and will not be considered further (See §264 552[c][4] and [7]) The five applicable criteria are evaluated in Table 5-2

Table 5-2
CSFS CAMU Criteria

Criteria and Citation	Justification
The CSFS must facilitate a reliable, effective, protective, cost effective remedy See §264 552(c)(1)	The CSFS represents the superior means of soil management prior to thermal treatment, will minimize the spread of contaminated soil, and is cost effective
The CSFS must not create unacceptable risks to humans or environment See §264 552(c)(2)	Due to the short duration of use, the storm-water and dust controls will effectively mitigate the primary mechanisms for release of contaminants
Uncontaminated areas may only be used if it is more protective than using contaminated areas See §264 552(c)(3)	CSFS will be placed at a location previously used for the same purpose
The CSFS must expedite timing of remedial activity See §264 552(c)(5)	The CSFS will expedite timing of the remedial activity by reducing handling
The CSFS must enable the use of thermal treatment See §264 552(c)(6)	The CSFS will enable the use of thermal treatment by providing a protective approach to stockpiling the contaminated feed near the TDU

The areal configuration of the CSFS and it's relation to the excavation area and TDU is provided in Figure 2-1 of the PAM (See §264 552[e][1]) The design operation and closure described in Section 3 2 2 addresses the requirements established in§264 552(c)(2)

5.2 5 RCRA Subpart P Thermal Treatment Unit

The use of a TDU to treat soil containing hazardous wastes requires a permit waiver For that reason the discussion in this section is being provided to satisfy ¶17 of RFCA

The substantive requirements found in RCRA §265 Subpart P are applicable to the thermal desorption activity, because thermal treatment will occur, but the thermal treatment will not be conducted as controlled combustion in an enclosed device (See §265 370)

If the unit is continuous feed, the thermal treatment process must be brought to normal operating temperature prior to commencing treatment (See §265 373) This is not a requirement if batch treatment is used The applicable waste analysis requirements are satisfied by the site characterization that has been performed and summarized in the PAM (See §265 375) Monitoring and inspections appropriate to the selected thermal desorption equipment will be conducted Included, as appropriate, are monitoring of instrumentation observing stack emissions, and inspecting equipment (See §265 377) The performance criteria and the requirement to re-treat materials that do not meet the performance criteria will act in lieu of specific treatment conditions Closure requirements for the TDU are presented in section 5 2 7

5 2 6 Temporary Unit Tank and Container Storage

The establishment of Temporary Units (TUs) may require a permit waiver if any of the tanks or containers are used for longer than 90-days For that reason the discussion in this section is being provided to satisfy ¶17 of RFCA

§264 553 provides that temporary tanks and containers used for the storage or treatment of hazardous remediation wastes may be subject to alternative design and operating and closure requirements as long as the requirements are protective of human health and the environment (See §264 553[a]) The TU must be located within the facility boundary and may only be used for treatment or storage of remediation wastes (See §264 553[b])

In establishing requirements for TUs seven factors must be considered the length of time the unit operates the type of unit, the volumes of remediation waste the physical and chemical characteristics of the remediation waste the potential for releases the conditions at the site that will influence migration and the potential for exposure if a release occurs (See §264 553[c])

In conjunction with the thermal desorption, all containers will be compatible with the waste and be in good condition If practicable, secondary containment will be provided for liquid wastes stored in containers

For tanks, piping and ancillary equipment used in conjunction with the thermal desorption activity, secondary containment will be provided where practicable Where secondary containment is not practicable (e g piping), the duration of operation, the low concentrations of hazardous constituents in the aqueous phase condensate, and the operator's continued presence during operations support an alternative requirement that does not include secondary containment Closure requirements for the TUs are presented in section 5 2 7

5 2 7 Closure Requirements

As noted earlier, the closure of the CSFS is described in section 3 2 2 The approach is to remove any residual soils which are above the Cleanup Action Levels and to treat those soils to below the TDU Performance Standards Any associated materials (e g tarpaulin, plastic trench lining) will be managed in accordance with regulations and RFETS procedures

This discussion addresses the requirements necessary to meet the closure performance standards for the TDU (§265 381) and for the TU tanks and containers (§264 553[a])

Following the completion of contaminated soil processing, the aqueous phase condensate granulated active carbon and used HEPA filters will be removed from the TDU and ancillary equipment and disposed of properly The TDU and associated equipment, and any TU tanks and containers will then be decontaminated according to procedure number 4-SO-ENV-OPS-I O 04 Decontamination of Equipment at Decontamination Facilities Performance standards are included in that procedure Two 10,000 gal TU tanks used to contain condensate will be emptied after use However it is not practical to close these tanks after completion of this task since these tanks will be used in future Environmental Restoration Activity

The decontamination procedure requires project personnel to complete an 'Equipment Decontamination/Wash Checklist and Record' sheet Project personnel must verify that equipment has ben decontaminated to levels specified in the procedure ROI 3 02 Performance of Surface Contamination Surveys This procedure incorporates the radiological release levels codified in 10 CFR 835 Radiation Protection of Occupational Workers Performing radiological

decontamination to the levels specified in 10 CFR 835 will ensure that all other forms of contamination are similarly removed

Decontamination methods and solution are described in procedure 4-SO-ENV-OPS-FO 04, referenced above Volumes of waste water generated during decontamination will depend on levels of contamination and the configuration of the vendor's thermal desorption unit All efforts will be made, however, to limit the amount of decontamination water generated, while still meeting the release standards specified in ROI 3 02

It is expected that any large scale decontamination will take place at decontamination facility located in the contractor's yard Efforts will be made to decontaminate equipment (e g the subcontractors TDU) sufficiently to allow reuse

5 2 8 VOC and Particulate Emission Controls

The excavation, transportation of soil, and thermal desorption all have the potential to emit particulates and VOCs The Colorado Air Pollution Control Regulations require that control measures be implemented for construction activities, haul roads, haul trucks, and demolition activities to prevent the emission of fugitive particulate in excess of air standards (ref 5 CCR 1001-3, Regulation No 1) RFETS procedures will be followed to minimize fugitive particulate emissions

The Colorado Air Pollution Control Regulations also require application of Reasonably Available Control Technologies (RACT) where there is a potential to emit more than one ton of VOCs Preliminary worst-case calculations estimate the total VOCs in the excavated soil at 0 59 tons For that reason, RACT is not applicable to the thermal desorption RACT is, however, considered relevant and appropriate as a feasible cost-effective means of minimizing VOC emissions (ref 5 CCR 1001-3, Regulation No 7)

For the thermal desorption, Granulated Activated Carbon will be employed to polish any VOCs not condensed GAC meets or exceeds the RACT requirement For the excavation activities based upon the low concentrations of VOC constituents in the soil it is reasonable to not employ specific VOC control measures

5 2 9 Radiation Protection of Occupational Workers

10 CFR 835 sets the requirements for all aspects of radiological controls for the project Requirements contained in 10 CFR 835 are implemented through RFETS radiological procedures All applicable RFETS radiological procedures will be followed

5 3 LOCATION-SPECIFIC REQUIREMENTS AND CONSIDERATIONS

No location-specific requirements or considerations unique to the activity were identified RFETS site procedures will be followed

6 0 IMPLEMENTATION SCHEDULE

The excavation of contaminated soils from the Mound Site is scheduled to commence in the spring of 1997 Treatment of the contaminated soils is scheduled to begin in the early summer of 1997 Data reduction and reporting efforts are scheduled to be completed by the end of the summer of 1997 Any delays, scope, or budget changes may affect these dates

7.0 REFERENCES

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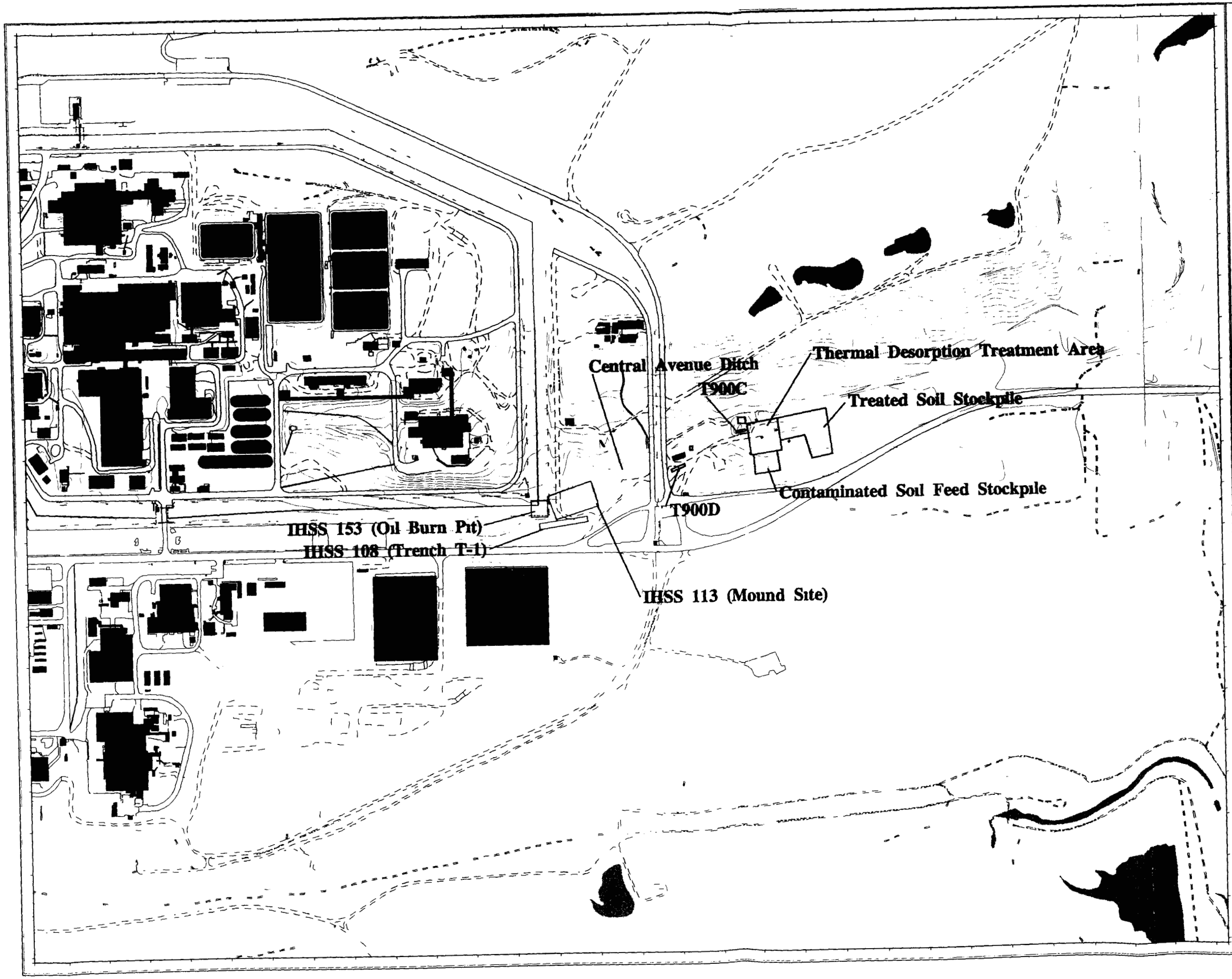
EPA, 1992, *Estimating Poential for Occurrence of DNAPL at Superfund Sites* OSWER Publication 9355 4-07/FS



Mound Site Location Map

Figure 2-1

EXPLANATION

Contours (5 int rvals)

IHSS

Standard Map Features

- Buildings or other structures
- Lakes and ponds
- Streams, ditches or other drainage features
- Fences
- Paved roads
- Dirt roads

DATA SOURCE
Buildings, roads, and fences provided by
Facilities Dept.,
EG&G Rocky Flats, Inc. 1998
Hydrology provided by
EPA/ (date unknown)

Scale 5430
Inch represents approximately 453 feet

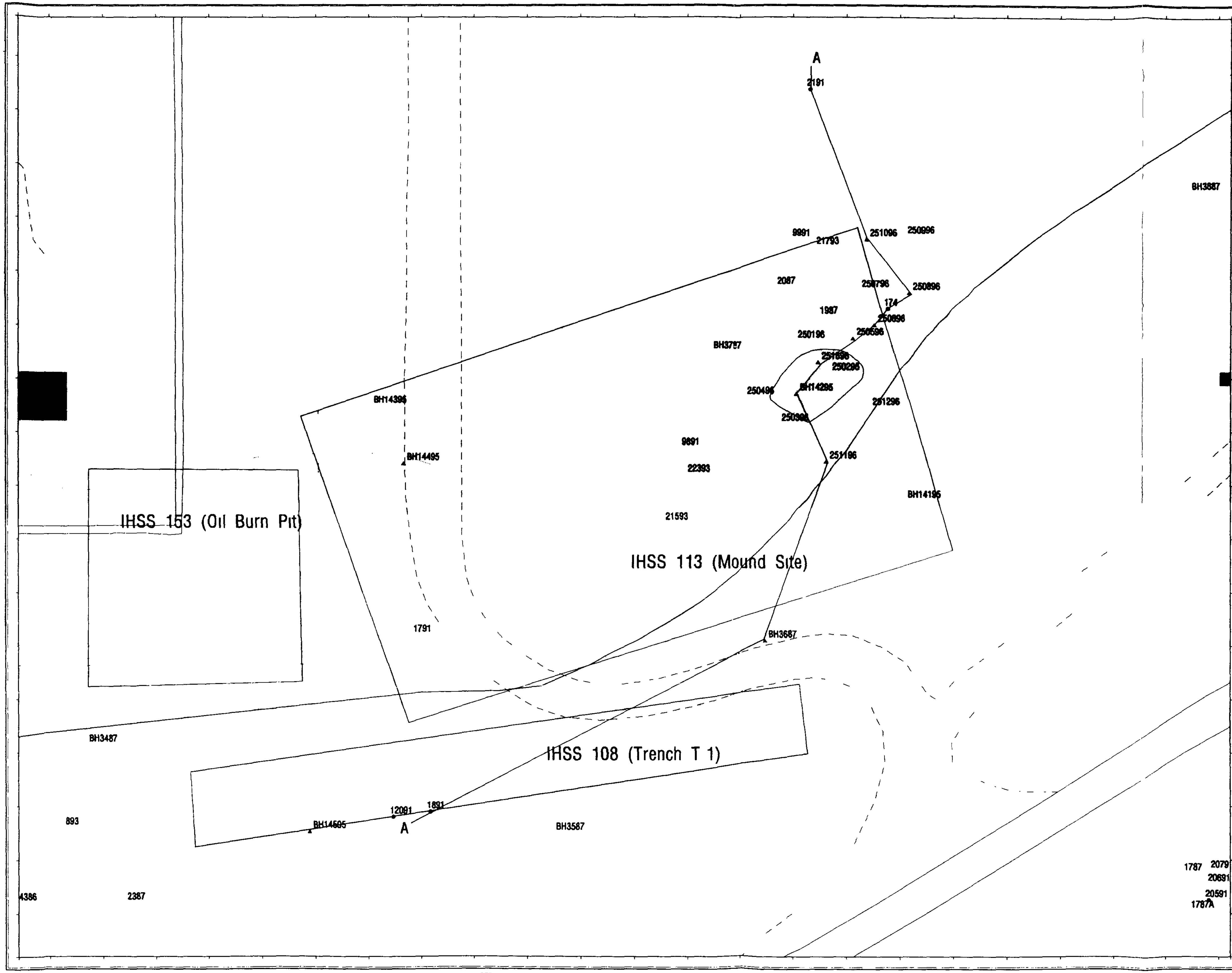
0 450 900 1800 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum NAD27

U S Department of Energy
Rocky Flats Environmental Technology Site

Prepared by
RMRS Rocky Mountain Remediation Services, L.L.C.
Geographic Information Systems Group
Rocky Flats Environmental Technology Site
Box 464
Golden, CO 80402-0464

MAP ID: 97-001 November 1998



Mound Site Boring and Well Location Map

Figure 2-2

EXPLANATION

- Line of Hydrogeologic Cross Section
- Cont urs (5 ntervals)
- IHSS
- Stream
- Groundwater Well Locations (Not Well 174 is bandoned)
- Borehole Locations
- Area t be excavated

Standard Map Features

- Buildings other structures
- Fences
- Paved roads
- D rt roads

ch represents ppr ximately 36 feet

tate Plane Coordinate Projection
Colorado Central Zone
Datum NAD2

U S Department of E ergy
Rocky Flats En i onmental Technology Site

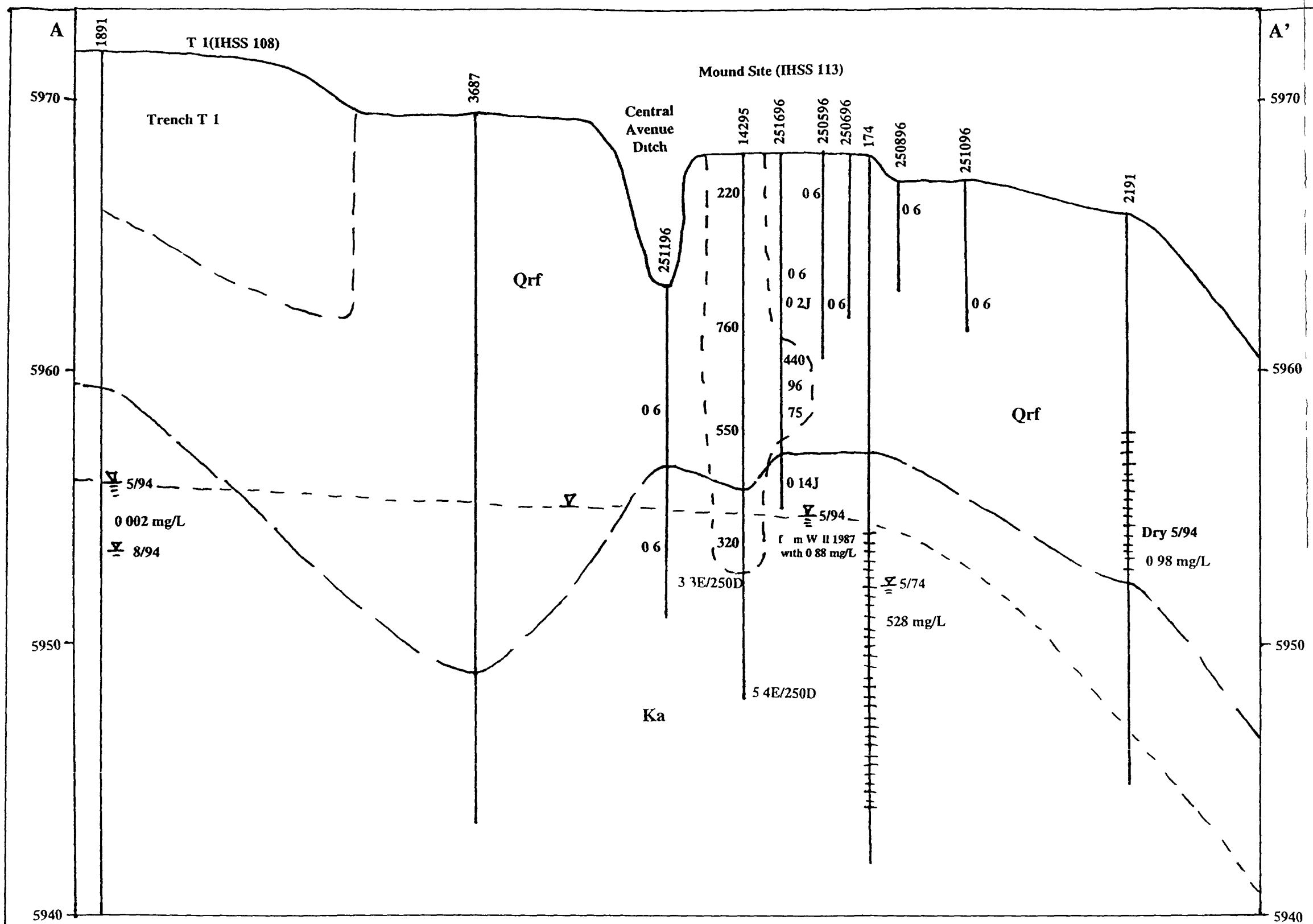
Prepared by
RMRS Rocky Mountain Remediation Services, L.L.C.

MAP ID: 97-00

November 06 996

MOUND SITE GENERALIZED HYDROGEOLOGIC CROSS SECTION

Figure 2 3



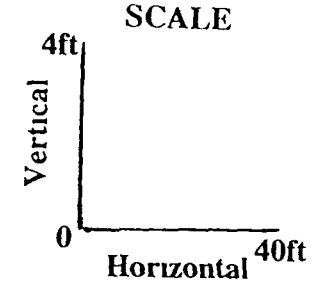
EXPLANATION

- Monitoring Well Screen Interval
- 8/94 — Water Level with Date of Measurement
- 0 6U — Concentration of Tetrachloroethene in Soil (reported in mg/Kg)
- 528 mg/L — Concentration of Tetrachloroethene in Water (reported in mg/L)
- Qrf — Rocky Flats Alluvium (Quaternary Age) (primarily clayey sandy gravel)
- Ka — Arapahoe Formation (Cretaceous Age) (primarily silty claystone)
- Bedrock Contact (dashed where inferred)
- Approximate Vertical Extent of Contamination

Note All values are maximum reported concentrations for tetrachloroethene
J=analyte was detected below method detection limit
D=dilution
E=estimated value

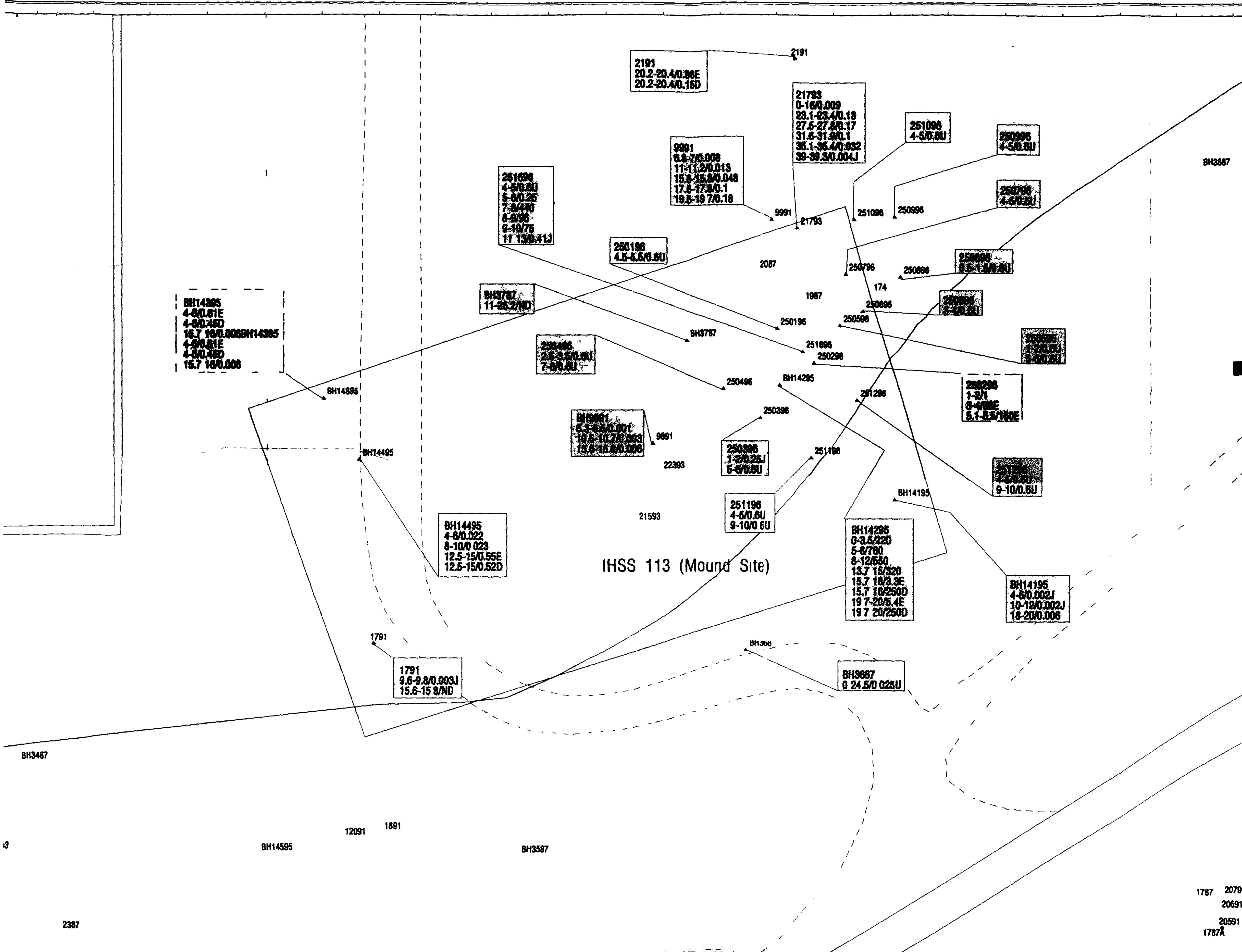
DRAFT

SCALE



10x Vertical Exaggeration

RMRS Rocky Mountain Remediation Services L L C
protecting th n l o ment



2191
20.2-20.4/0.98E
20.2-20.4/0.15D
21793
0-16/0.009
23.1-23.4/0.13
27.5-27.8/0.17
31.6-31.9/0.1
35.1-35.4/0.032
39-39.3/0.004J
251096
4-5/0.6U
250996
4-5/0.6U
9991
6.8-7/0.008
11-11.2/0.013
15.8-15.8/0.048
17.6-17.8/0.1
19.8-19 7/0.18
251696
4-5/0.6U
5-6/0.25
7-8/440
8-9/96
9-10/75
11 13/0.41J
250196
4.5-5.5/0.6U
BH3787
11-26.2/ND
BH14395
4-6/0.61E
4-6/0.45D
15.7 16/0.006
4-6/0.61E
4-6/0.45D
15.7 16/0.006
BH14495
4-6/0.022
8-10/0 023
12.5-15/0.55E
12.5-15/0.52D
IHSS 113 (Mound Site)
250396
1-2/0.25J
5-6/0.6U
251196
4-5/0.6U
9-10/0 6U
BH14295
0-3.5/220
5-8/760
8-12/550
13.7 15/320
15.7 18/3.3E
15.7 18/250D
19 7-20/5.4E
19 7 20/250D
BH14195
4-6/0.002J
10-12/0.002J
18-20/0.006
9-10/0.6U
1791
9.6-9.8/0.003J
15.6-15 8/ND
BH3667
0 24.5/0 025U
BH3487
BH3667
BH14595
BH3587
12091
1891
2387
21593
22393
2087
1987
174
1787
20791
20691
20591

PCE Concentrations at Mound Site Boreholes

Figure 2-4

EXPLANATION

Contours (5 I tervals)

IHSS

Stream

Groundwater Well Locations

Borehole Locations
5 8/760
5-8 = Sample Depth
760 = Concentration(mg/Kg)

Standard Map Features

Build'ngs or othe structures

Fences

Paved roads

Dirt roads

NOTE:

tate Plane oordin te Projection
Colorado Central on
Datum NA 7

U S Department of E ergy
Rocky Flats Envi onme tal Technology Site

Prepared by:

RMRS Rocky Mountain Remediation Services, L.L.C.
Geographic Information Systems Group

MAP ID 97-001

November 12, 1996